

1/60

SEQUENCE LISTING

<110> Meiji Seika Kaisha, Ltd.

<120> Cyclic depsipeptide synthetase and its gene and mass production system of cyclic depsipeptide

<130> 127184

<150> JP 253040/1999

<151> 1999-09-07

<150> JP 104291/2000

<151> 2000-04-06

<160> 21

<170> PatentIn Ver. 2.1

<210> 1

<211> 9633

<212> DNA

<213> Mycelia sterilia

<220>

<221> CDS

<222> (1)..(9633)

<223> peptide synthetase for PF1022

<220>

2/60

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&lt;222&gt; (13)..(9630)

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Leu Ser Leu Ser Cys Pro Leu Leu Pro His Asp Asp Glu Lys His Ser

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gac aac ctt tac gag caa gca act cgg cac ttc ggc ttg agc cga gac 144

Asp Asn Leu Tyr Glu Gln Ala Thr Arg His Phe Gly Leu Ser Arg Asp

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aag atc gaa aat gtc tta cca tgt act tcc ttt caa tgt gat gtc ata 192

Lys Ile Glu Asn Val Leu Pro Cys Thr Ser Phe Gln Cys Asp Val Ile

45 50 55 60

gat tgc gcc gtc gac gat cgg cgg cat gct atc ggt cac gtc gtc tat 240

Asp Cys Ala Val Asp Asp Arg Arg His Ala Ile Gly His Val Val Tyr

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gat atc ccc aat aca gtg gac atc cag cgt tta gcc gca gcc tgg aaa 288

Asp Ile Pro Asn Thr Val Asp Ile Gln Arg Leu Ala Ala Ala Trp Lys

80 85 90

gag gtt gtg cgg cag aca cca atc ttg agg acc ggc atc ttt aca tca 336

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Glu Val Val Arg Gln Thr Pro Ile Leu Arg Thr Gly Ile Phe Thr Ser

95

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gaa acc ggc gac tct ttt cag atc gtc ttg aaa gaa ggc tgc cta ccg 384

Glu Thr Gly Asp Ser Phe Gln Ile Val Leu Lys Glu Gly Cys Leu Pro

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tgg atg tac gcg aca tgt ctc ggc atg aag ggg gca gtg ata caa gat 432

Trp Met Tyr Ala Thr Cys Leu Gly Met Lys Gly Ala Val Ile Gln Asp

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gaa gca gtc gcc gct atg act gga ccg cgt tgc aat cga tat gtc gtc 480

Glu Ala Val Ala Ala Met Thr Gly Pro Arg Cys Asn Arg Tyr Val Val

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ctg gag gac ccg agt acg aag caa agg ctg ctc atc tgg aca ttc agc 528

Leu Glu Asp Pro Ser Thr Lys Gln Arg Leu Leu Ile Trp Thr Phe Ser

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cat gct tta gtg gat tat aca gtc cag gaa cgc atc ctt cag cgg gtt 576

His Ala Leu Val Asp Tyr Thr Val Gln Glu Arg Ile Leu Gln Arg Val

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ctc aca gta tac gac ggc cgg gac gtc gag tgc cct cgc atc aag gat 624

Leu Thr Val Tyr Asp Gly Arg Asp Val Glu Cys Pro Arg Ile Lys Asp

190

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4/60

aca gaa cat gtc tct cgg ttt tgg caa caa cac ttt gaa ggc tta gat 672  
 Thr Glu His Val Ser Arg Phe Trp Gln Gln His Phe Glu Gly Leu Asp  
 205 210 215 220

gcc tcc gta ttt ccc ctt cta cca tct cac cta act gtg tgc aat ccc 720  
 Ala Ser Val Phe Pro Leu Leu Pro Ser His Leu Thr Val Cys Asn Pro  
 225 230 235

aat gcg cgc gca gaa cat cat atc tca tac acg gga cca gtc cag agg 768  
 Asn Ala Arg Ala Glu His His Ile Ser Tyr Thr Gly Pro Val Gln Arg  
 240 245 250

aag tgg tcc cat aca agt atc tgt cgg gct gca ctc gca gtt ctt cta 816  
 Lys Trp Ser His Thr Ser Ile Cys Arg Ala Ala Leu Ala Val Leu Leu  
 255 260 265

tct cgc ttt aca cac tct tcg gag gcc ctc ttc ggt gtt gtg aca gaa 864  
 Ser Arg Phe Thr His Ser Ser Glu Ala Leu Phe Gly Val Val Thr Glu  
 270 275 280

caa tct cac aac tcc gag gac caa aga cgg tca att gat ggc ccc gca 912  
 Gln Ser His Asn Ser Glu Asp Gln Arg Arg Ser Ile Asp Gly Pro Ala  
 285 290 295 300

agg aca gta gtg cct atc cgc gtc ctt tgt gcc cca gat caa tat gtg 960  
 Arg Thr Val Val Pro Ile Arg Val Leu Cys Ala Pro Asp Gln Tyr Val  
 305 310 315

5/60

tcg gat gtc att ggg gca atc acc gca cac gaa cac gcc atg cgc ggg 1008

Ser Asp Val Ile Gly Ala Ile Thr Ala His Glu His Ala Met Arg Gly

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ttt gag cac gct gga ctt cgc aat atc cgc cgt acc gga gac gac ggg 1056

Phe Glu His Ala Gly Leu Arg Asn Ile Arg Arg Thr Gly Asp Asp Gly

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Ser Ala Ala Cys Gly Phe Gln Thr Val Leu Leu Val Thr Asp Gly Asp

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gct ccc aag acc cct ggg agt gta ctt cat cga agt gta gaa gaa tcg 1152

Ala Pro Lys Thr Pro Gly Ser Val Leu His Arg Ser Val Glu Glu Ser

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gat aga ttc atg ccc tgc gct aat cgt gcc ctt ctg ctc gac tgc cag 1200

Asp Arg Phe Met Pro Cys Ala Asn Arg Ala Leu Leu Leu Asp Cys Gln

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atg gct ggc aac tcg gca tcc cta gtc gca cga tat gat cat aat gtg 1248

Met Ala Gly Asn Ser Ala Ser Leu Val Ala Arg Tyr Asp His Asn Val

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415

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6/60

atc caa caa ttt cat cat cac gtc gat ctg cct ctg gtc aaa gaa ctg 1344

Ile Gln Gln Phe His His His Val Asp Leu Pro Leu Val Lys Glu Leu

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gac gtc gtg acg gcg gag gat tgt gcg gaa atc gag aaa tgg aat tca 1392

Asp Val Val Thr Ala Glu Asp Cys Ala Glu Ile Glu Lys Trp Asn Ser

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gaa cgc cta aca atg caa gac gcc tta atc cac gac acc ata tcc aag 1440

Glu Arg Leu Thr Met Gln Asp Ala Leu Ile His Asp Thr Ile Ser Lys

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tgg gct gct ggc gat ccc aac aaa gct gca gtt ttc gct tgg gat ggg 1488

Trp Ala Ala Gly Asp Pro Asn Lys Ala Ala Val Phe Ala Trp Asp Gly

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gaa tgg aca tac gcc gag cta gac aac ata tcc tcc cgt ctc gcc gtg 1536

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tat atc caa tcc ctg gac ttg aga cca gga caa gca ata ctc cca ctc 1584

Tyr Ile Gln Ser Leu Asp Leu Arg Pro Gly Gln Ala Ile Leu Pro Leu

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Cys Phe Glu Lys Ser Lys Trp Val Val Ala Thr Ile Leu Ala Val Leu

525

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7/60

aaa gtc ggt cgg gca ttc aca ctc atc gac ccg tgc gac ccc tcg gca 1680

Lys Val Gly Arg Ala Phe Thr Leu Ile Asp Pro Cys Asp Pro Ser Ala

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agg atg gcc cag gtc tgt cag cag acc tcc gcc aca gtc gct ctc acc 1728

Arg Met Ala Gln Val Cys Gln Gln Thr Ser Ala Thr Val Ala Leu Thr

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tcc aaa ctc cac aac acc acc tta cgt tcc gtc gtt tcc cgc tgc att 1776

Ser Lys Leu His Asn Thr Thr Leu Arg Ser Val Val Ser Arg Cys Ile

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gtg gtc gac gac gac ctc ctt cgg tcc tta ccc cac gcc gat ggc cgc 1824

Val Val Asp Asp Asp Leu Leu Arg Ser Leu Pro His Ala Asp Gly Arg

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tta aag gcc acc gtg aag cca cag gac ttg gcc tat gtt att ttc aca 1872

Leu Lys Ala Thr Val Lys Pro Gln Asp Leu Ala Tyr Val Ile Phe Thr

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tct ggc agc aca gga gag ccg aaa ggc atc atg atc gaa cat cgg ggg 1920

Ser Gly Ser Thr Gly Glu Pro Lys Gly Ile Met Ile Glu His Arg Gly

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ttc gtg tcg tgt gct atg aaa ttt ggc ccc gcg ctc gga atg gat gag 1968

Phe Val Ser Cys Ala Met Lys Phe Gly Pro Ala Leu Gly Met Asp Glu

640

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8/60

cac acg cgc gct ctt caa ttc gcc tca tat gcg ttt ggc gct tgt ctg 2016

His Thr Arg Ala Leu Gln Phe Ala Ser Tyr Ala Phe Gly Ala Cys Leu

655

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665

gta gaa gtt gtg aca gct ctg atg cac ggc ggc tgc gtc tgc atc cct 2064

Val Glu Val Val Thr Ala Leu Met His Gly Gly Cys Val Cys Ile Pro

670

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tcc gat gac gat cgc ttg aac aat gta ccg gag ttc atc aaa agg gcc 2112

Ser Asp Asp Asp Arg Leu Asn Asn Val Pro Glu Phe Ile Lys Arg Ala

685

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cag gtg aac tgg gtg ata ctc act ccg tcg tat atc ggg aca ttc cag 2160

Gln Val Asn Trp Val Ile Leu Thr Pro Ser Tyr Ile Gly Thr Phe Gln

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ccg gaa gat gtc cct gga cta caa aca ctg gta ttg gtt gga gaa cct 2208

Pro Glu Asp Val Pro Gly Leu Gln Thr Leu Val Leu Val Gly Glu Pro

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atc tca gcg tct att cgg gat acc tgg gcc tcc cag gtt cga ctc ctg 2256

Ile Ser Ala Ser Ile Arg Asp Thr Trp Ala Ser Gln Val Arg Leu Leu

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aat gcc tac ggt cag agt gaa agc tca act atg tgc agc gtc acg gaa 2304

Asn Ala Tyr Gly Gln Ser Glu Ser Ser Thr Met Cys Ser Val Thr Glu

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760

9/60

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 Val Ser Pro Leu Ser Leu Glu Pro Asn Asn Ile Gly Arg Ala Val Gly  
 765 770 775 780

gca cga tcc tgg atc att gat ccc gac gag cct gat cgt ctt gct cca 2400  
 Ala Arg Ser Trp Ile Ile Asp Pro Asp Glu Pro Asp Arg Leu Ala Pro  
 785 790 795

att ggc tgc att gga gag cta gtg atc gaa agt ccg ggc att gcg cgc 2448  
 Ile Gly Cys Ile Gly Glu Leu Val Ile Glu Ser Pro Gly Ile Ala Arg  
 800 805 810

gac tat atc atc gcg ccg ccg ccg gac aag tcc ccc ttt ctc cta gca 2496  
 Asp Tyr Ile Ile Ala Pro Pro Pro Asp Lys Ser Pro Phe Leu Leu Ala  
 815 820 825

ccc ccg gcc tgg tat cca gcc ggg aaa tta tcc aac gcc ttt aaa ttt 2544  
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 Tyr Lys Thr Gly Asp Leu Val Arg Tyr Gly Pro Asp Gly Thr Ile Val  
 845 850 855 860

tgc ctg gga cgc aaa gat tcg caa gtg aag atc cga ggg cag cgc gta 2640  
 Cys Leu Gly Arg Lys Asp Ser Gln Val Lys Ile Arg Gly Gln Arg Val  
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10/60

gag atc agc gca gtg gaa gcc agt cta cga cga caa cta cct agt gac 2688

Glu Ile Ser Ala Val Glu Ala Ser Leu Arg Arg Gln Leu Pro Ser Asp

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Ile Met Pro Val Ala Glu Ala Ile Lys Arg Ser Asp Ser Ser Gly Ser

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Thr Val Leu Thr Ala Phe Leu Ile Gly Ser Ser Lys Ser Gly Asp Gly

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aat ggc cac gct tta tct gcg gca gac gcc gtt atc ttg gat cac ggt 2832

Asn Gly His Ala Leu Ser Ala Ala Asp Ala Val Ile Leu Asp His Gly

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gct acc aac gag ata aac gcg aag ttg cag caa atc ctt ccc cag cat 2880

Ala Thr Asn Glu Ile Asn Ala Lys Leu Gln Gln Ile Leu Pro Gln His

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tcc gtt cca tcc tat tat atc cac atg gaa aat ctt cct cga act gcc 2928

Ser Val Pro Ser Tyr Tyr Ile His Met Glu Asn Leu Pro Arg Thr Ala

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acc ggc aaa gcg gac agg aaa atg ctt cga tct att gct agc aag cta 2976

Thr Gly Lys Ala Asp Arg Lys Met Leu Arg Ser Ile Ala Ser Lys Leu

975

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985

11/60

ttg ggt gaa ttg tct cag aac gtg aca tct caa ccg att gag aag cac 3024

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gat gcc cca gca act ggt ata gag gtc aag ctg aag gag ctt tgg ttt 3072

Asp Ala Pro Ala Thr Gly Ile Glu Val Lys Leu Lys Glu Leu Trp Phe

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1015

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ctg agc ttg aat ctt aat ccc aac tct caa gat gtc gga gcg agt ttc 3120

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ttt gac tta ggc gga aat tcc att atc gcc atc aaa atg gta aac atg 3168

Phe Asp Leu Gly Gly Asn Ser Ile Ile Ala Ile Lys Met Val Asn Met

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gcg agg tca gct ggg ata gca ctg aag gta tcc gac ata ttc cag aat 3216

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Tyr Asn Leu Ile Pro Thr Thr Ala Tyr Ser Gly Pro Val Glu Gln Ser

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1090

1095

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12/60

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1105

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1125

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att gat gcg ctc act att gcg ttg cta gct ata cag caa cga cat gaa 3456

Ile Asp Ala Leu Thr Ile Ala Leu Leu Ala Ile Gln Gln Arg His Glu

1135

1140

1145

acc ttg cgg aca acc ttt gag gag cag gac ggc gta ggc gtt cag gtt 3504

Thr Leu Arg Thr Thr Phe Glu Glu Gln Asp Gly Val Gly Val Gln Val

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1155

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Val His Ala Ser Pro Ile Ser Asp Leu Arg Ile Ile Asp Val Ser Gly

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Asp Arg Asn Ser Asp Tyr Leu Gln Leu Leu His Gln Glu Gln Thr Thr

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1190

1195

cca ttc att cta gca tgt cag gca gga tgg agg gta tca ctg att aga 3648

Pro Phe Ile Leu Ala Cys Gln Ala Gly Trp Arg Val Ser Leu Ile Arg

1200

1205

1210

13/60

cta gga gaa gat gat cac atc ctc tct atc gta atg cat cac atc atc 3696

Leu Gly Glu Asp Asp His Ile Leu Ser Ile Val Met His His Ile Ile

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1220

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Ser Asp Gly Trp Ser Ile Asp Ile Leu Arg Arg Glu Leu Ser Asn Phe

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tat tca gcc gct ctc cgg ggc tct gat cct cta tcg gtg gtg agc cca 3792

Tyr Ser Ala Ala Leu Arg Gly Ser Asp Pro Leu Ser Val Val Ser Pro

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ctc cca ctc cac tac cgc gac ttt tcc gtt tgg caa aag cag gtc gaa 3840

Leu Pro Leu His Tyr Arg Asp Phe Ser Val Trp Gln Lys Gln Val Glu

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cag gag acc gaa cat gag cgg caa ctc gaa tac tgg gtc aag cag ctc 3888

Gln Glu Thr Glu His Glu Arg Gln Leu Glu Tyr Trp Val Lys Gln Leu

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gca gac agc tcg gcc gcc gaa ttc cta acc gac ttc ccc cga ccc aac 3936

Ala Asp Ser Ser Ala Ala Glu Phe Leu Thr Asp Phe Pro Arg Pro Asn

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1305

ata ctg tcc ggt gaa gca ggt tcc gtg cca gtg acg atc gaa ggc gaa 3984

Ile Leu Ser Gly Glu Ala Gly Ser Val Pro Val Thr Ile Glu Gly Glu

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14/60

ctg tat gaa agg ctc caa gaa ttc tgt aaa gta gag caa atg acg cct 4032  
 Leu Tyr Glu Arg Leu Gln Glu Phe Cys Lys Val Glu Gln Met Thr Pro  
 1325 1330 1335 1340

ttc gcc gtg ttg tta ggg gcc ttc cgc gcg acc cat tat cgt ctc acc 4080  
 Phe Ala Val Leu Leu Gly Ala Phe Arg Ala Thr His Tyr Arg Leu Thr  
 1345 1350 1355

ggc gcc gaa gac tcg atc atc ggc acg ccc atc gcg aac cgc aac cgc 4128  
 Gly Ala Glu Asp Ser Ile Ile Gly Thr Pro Ile Ala Asn Arg Asn Arg  
 1360 1365 1370

cag gag ctt gaa aac atg atc ggc ttc ttc gtc aac acc caa tgc atg 4176  
 Gln Glu Leu Glu Asn Met Ile Gly Phe Phe Val Asn Thr Gln Cys Met  
 1375 1380 1385

cga atc acg gtc gac ggc gac gac act ttt gaa agc ctg gtg cga caa 4224  
 Arg Ile Thr Val Asp Gly Asp Asp Thr Phe Glu Ser Leu Val Arg Gln  
 1390 1395 1400

gtt cgg acc acg gcg acg gcg gca ttc gag cac caa gac gtc ccc ttt 4272  
 Val Arg Thr Thr Ala Thr Ala Ala Phe Glu His Gln Asp Val Pro Phe  
 1405 1410 1415 1420

gag cgc gtc gtg acg gca ctc ctt cca cgc tcg aga gac cta tcc cga 4320  
 Glu Arg Val Val Thr Ala Leu Leu Pro Arg Ser Arg Asp Leu Ser Arg  
 1425 1430 1435

15/60

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Asn Pro Leu Ala Gln Leu Thr Phe Ala Leu His Ser Gln Gln Asp Leu	
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ggc aag ttc gag ctg gag ggt ctc gta gcg gaa ccc gtc tcg aac aag	4416
Gly Lys Phe Glu Leu Glu Gly Leu Val Ala Glu Pro Val Ser Asn Lys	
1455 1460 1465	
gta tac acc agg ttc gac gtg gag ttt cac ctg ttc caa gaa gcc gga	4464
Val Tyr Thr Arg Phe Asp Val Glu Phe His Leu Phe Gln Glu Ala Gly	
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aga cta agc ggt aac gtg gca ttt gcg gca gat cta ttc aag cct gag	4512
Arg Leu Ser Gly Asn Val Ala Phe Ala Ala Asp Leu Phe Lys Pro Glu	
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acc att agc aat gta gtc gcc ata ttt ttc caa atc ctg cga caa ggc	4560
Thr Ile Ser Asn Val Val Ala Ile Phe Phe Gln Ile Leu Arg Gln Gly	
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Ile Arg Gln Pro Arg Thr Pro Ile Ala Val Leu Pro Leu Thr Asp Gly	
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Leu Ala Asp Leu Arg Ala Met Gly Leu Leu Glu Ile Glu Lys Ala Glu	
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16/60

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1555

1560

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 Ala His Pro His Ala Phe Ala Val Val Asp Ser Ala Ser Arg Leu Thr  
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tat gct gat ctc gat cgt caa tcc gat caa ctc gcg acc tgg ctc ggt 4800  
 Tyr Ala Asp Leu Asp Arg Gln Ser Asp Gln Leu Ala Thr Trp Leu Gly  
 1585 1590 1595

cgg cgc aat atg acg gct gag acg ctg gtc ggg gtg tta gca ccg cgg 4848  
 Arg Arg Asn Met Thr Ala Glu Thr Leu Val Gly Val Leu Ala Pro Arg  
 1600 1605 1610

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 Ser Cys Gln Thr Val Val Ala Ile Leu Gly Ile Leu Lys Ala Asn Leu  
 1615 1620 1625

gca tat ctc ccg ctt gat gtg aat tgt cct acc gcc cgc ctg caa aca 4944  
 Ala Tyr Leu Pro Leu Asp Val Asn Cys Pro Thr Ala Arg Leu Gln Thr  
 1630 1635 1640

atc cta tct aca ttg aat cgg cac aag ttg gtc cta ctc ggc tct aac 4992  
 Ile Leu Ser Thr Leu Asn Arg His Lys Leu Val Leu Leu Gly Ser Asn  
 1645 1650 1655 1660

17/60

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1665

1670

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Ser Asp Ile Leu Asp Arg Pro Ile Asn Gly Gln Ala Lys Leu Asn Gly

1680

1685

1690

cat aca aaa tcg aat ggc tac tca aag cca aac ggc tat acg cat ctg 5136

His Thr Lys Ser Asn Gly Tyr Ser Lys Pro Asn Gly Tyr Thr His Leu

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1700

1705

aaa ggc tat tca aac cta aac ggt tat tca aaa caa aat ggt tat gca 5184

Lys Gly Tyr Ser Asn Leu Asn Gly Tyr Ser Lys Gln Asn Gly Tyr Ala

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1715

1720

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Gln Leu Asn Gly His Arg Glu Arg Asn Asn Tyr Leu Asp Leu Asn Gly

1725

1730

1735

1740

cac tca ctg cta aat ggg aat tca gac atc acc aca tca ggg ccc tca 5280

His Ser Leu Leu Asn Gly Asn Ser Asp Ile Thr Thr Ser Gly Pro Ser

1745

1750

1755

gca aca agc ctt gcc tac gtg atc ttc aca tcc ggc tca acc gga aag 5328

Ala Thr Ser Leu Ala Tyr Val Ile Phe Thr Ser Gly Ser Thr Gly Lys

1760

1765

1770

18/60

ccc aaa gga gtc atg gtc gaa cac cgc agc atc atc cga ctt gca aag	5376
Pro Lys Gly Val Met Val Glu His Arg Ser Ile Ile Arg Leu Ala Lys	
1775                      1780                      1785	
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Lys Asn Arg Ile Ile Ser Arg Phe Pro Ser Val Ala Lys Val Ala His	
1790                      1795                      1800	
ctc tca aac atc gcc ttt gac gcc gcc act tgg gaa atg ttc gca gcc	5472
Leu Ser Asn Ile Ala Phe Asp Ala Ala Thr Trp Glu Met Phe Ala Ala	
1805                      1810                      1815                      1820	
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Leu Leu Asn Gly Gly Thr Leu Val Cys Ile Asp Tyr Met Thr Thr Leu	
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Asp Ser Lys Thr Leu Glu Ala Ala Phe Ala Arg Glu Gln Ile Asn Ala	
1840                      1845                      1850	
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Ala Leu Leu Thr Pro Ala Leu Leu Lys Gln Cys Leu Ala Asn Ile Pro	
1855                      1860                      1865	
act acc cta ggc agg ctg agt gca ctc gtt att gga ggt gat agg ctt	5664
Thr Thr Leu Gly Arg Leu Ser Ala Leu Val Ile Gly Gly Asp Arg Leu	
1870                      1875                      1880	

19/60

gac ggc caa gac gcg atc gca gca cat gcg ctt gtc ggt gct ggc gtg 5712  
 Asp Gly Gln Asp Ala Ile Ala Ala His Ala Leu Val Gly Ala Gly Val  
 1885 1890 1895 1900

tat aat gcg tat ggc ccg acc gaa aac gga gtg atc agt acg att tat 5760  
 Tyr Asn Ala Tyr Gly Pro Thr Glu Asn Gly Val Ile Ser Thr Ile Tyr  
 1905 1910 1915

aat atc act aaa aac gac tcg ttc atc aac gga gtc ccc atc ggc tgt 5808  
 Asn Ile Thr Lys Asn Asp Ser Phe Ile Asn Gly Val Pro Ile Gly Cys  
 1920 1925 1930

gca atc agc aat tcc ggc gcc tac atc aca gac cca gac cag cag ctc 5856  
 Ala Ile Ser Asn Ser Gly Ala Tyr Ile Thr Asp Pro Asp Gln Gln Leu  
 1935 1940 1945

gta cct cct ggc gtc atg ggt gaa ctc gtc gtt acc ggt gac ggg ctc 5904  
 Val Pro Pro Gly Val Met Gly Glu Leu Val Val Thr Gly Asp Gly Leu  
 1950 1955 1960

gcg cgg ggg tat aca gac cca gca cta gac gcg ggc cgc ttc gtc cag 5952  
 Ala Arg Gly Tyr Thr Asp Pro Ala Leu Asp Ala Gly Arg Phe Val Gln  
 1965 1970 1975 1980

atc atg atc aat gac aag gcc gtg agg gcg tac cga acg ggt gac cgg 6000  
 Ile Met Ile Asn Asp Lys Ala Val Arg Ala Tyr Arg Thr Gly Asp Arg  
 1985 1990 1995

20/60

gca cga tat cgc gta gga gac ggt cag atc gag ttc ttc gga cgc atg 6048

Ala Arg Tyr Arg Val Gly Asp Gly Gln Ile Glu Phe Phe Gly Arg Met

2000

2005

2010

gat cag caa gtc aag atc cga ggt cac cgc att gaa cca gcc gaa gtg 6096

Asp Gln Gln Val Lys Ile Arg Gly His Arg Ile Glu Pro Ala Glu Val

2015

2020

2025

gag cgt gct att ctc gac caa gac tcg gcc cgc gac gcc gtc gtt gtc 6144

Glu Arg Ala Ile Leu Asp Gln Asp Ser Ala Arg Asp Ala Val Val Val

2030

2035

2040

atc cgg cac caa gaa ggt gaa gaa ccg gag atg gtt ggt ttc gtc gcg 6192

Ile Arg His Gln Glu Gly Glu Glu Pro Glu Met Val Gly Phe Val Ala

2045

2050

2055

2060

acc cac ggc gat cac tct gcc gaa caa gag gaa gca gac gac cag gtt 6240

Thr His Gly Asp His Ser Ala Glu Gln Glu Glu Ala Asp Asp Gln Val

2065

2070

2075

gaa ggt tgg aaa gac ttc ttc gag agc aat aca tat gcc gac atg gat 6288

Glu Gly Trp Lys Asp Phe Phe Glu Ser Asn Thr Tyr Ala Asp Met Asp

2080

2085

2090

acc atc ggc cag tct gct ata ggc aac gac ttt acg ggc tgg acg tcc 6336

Thr Ile Gly Gln Ser Ala Ile Gly Asn Asp Phe Thr Gly Trp Thr Ser

2095

2100

2105

atg tac gac ggc agc gag atc aac aag gcc gag atg cag gag tgg ctc	6384
Met Tyr Asp Gly Ser Glu Ile Asn Lys Ala Glu Met Gln Glu Trp Leu	
2110 2115 2120	
gac gac acc atg cgc aca ctc ctc gat ggc caa gcg ccg ggt cac gta	6432
Asp Asp Thr Met Arg Thr Leu Leu Asp Gly Gln Ala Pro Gly His Val	
2125 2130 2135 2140	
ctc gaa ata ggc aca ggc agt ggc atg gta ttg ttt aac tta ggg gcc	6480
Leu Glu Ile Gly Thr Gly Ser Gly Met Val Leu Phe Asn Leu Gly Ala	
2145 2150 2155	
ggg cta caa agc tac gta ggt ctt gaa cca tct aga tct gca gcc acg	6528
Gly Leu Gln Ser Tyr Val Gly Leu Glu Pro Ser Arg Ser Ala Ala Thr	
2160 2165 2170	
ttt gtt acc aaa gcg atc aat tcc acc cca gct ctt gca gga aag gcc	6576
Phe Val Thr Lys Ala Ile Asn Ser Thr Pro Ala Leu Ala Gly Lys Ala	
2175 2180 2185	
gaa gtg cac gtc ggc aca gcg aca gac ata aac cga ctt cgt gga ctt	6624
Glu Val His Val Gly Thr Ala Thr Asp Ile Asn Arg Leu Arg Gly Leu	
2190 2195 2200	
cgt ccc gat cta gtt gtg ctc aac tcg gta gtc cag tat ttc ccc acg	6672
Arg Pro Asp Leu Val Val Leu Asn Ser Val Val Gln Tyr Phe Pro Thr	
2205 2210 2215 2220	

22/60

ccc gag tac cta cta gag gtc gtg gag agt ctc gtc cgg att ccg ggc 6720

Pro Glu Tyr Leu Leu Glu Val Val Glu Ser Leu Val Arg Ile Pro Gly

2225

2230

2235

gtc aag cgc gtg gtc ttc ggc gac ata cga tct cac gcc acg aac aga 6768

Val Lys Arg Val Val Phe Gly Asp Ile Arg Ser His Ala Thr Asn Arg

2240

2245

2250

cat ttt ctt gct gcc agg ggc ctg cat tcg ctg ggc tcc aag ggc acc 6816

His Phe Leu Ala Ala Arg Ala Leu His Ser Leu Gly Ser Lys Ala Thr

2255

2260

2265

aaa gat gct ata cgt caa aag atg acg gag atg gaa gag cgc gag gaa 6864

Lys Asp Ala Ile Arg Gln Lys Met Thr Glu Met Glu Glu Arg Glu Glu

2270

2275

2280

gag ctg ctc gtc gac ccg gcc ttc ttc acg ggc ctg ctg cag gcc cag 6912

Glu Leu Leu Val Asp Pro Ala Phe Phe Thr Ala Leu Leu Gln Gly Gln

2285

2290

2295

2300

ctt gcc gat cga atc aag cac gtc gag atc ctc ccg aag aac atg cgc 6960

Leu Ala Asp Arg Ile Lys His Val Glu Ile Leu Pro Lys Asn Met Arg

2305

2310

2315

gcc acg aac gag ctg agc ggc tac cgg tat aca gcc gtc att cac gta 7008

Ala Thr Asn Glu Leu Ser Ala Tyr Arg Tyr Thr Ala Val Ile His Val

2320

2325

2330

23/60

cgc ggc cca gag gaa cag tcg cgg ccc gtg tat ccg atc caa gtg aac 7056

Arg Gly Pro Glu Glu Gln Ser Arg Pro Val Tyr Pro Ile Gln Val Asn

2335

2340

2345

gac tgg atc gac ttt cag gcc tca cgc att gac cgc cgc gcc ctt ctc 7104

Asp Trp Ile Asp Phe Gln Ala Ser Arg Ile Asp Arg Arg Ala Leu Leu

2350

2355

2360

cga ctc cta cag cgc tcg gca gac gcc gcg acc gtc gcc gtc agc aac 7152

Arg Leu Leu Gln Arg Ser Ala Asp Ala Ala Thr Val Ala Val Ser Asn

2365

2370

2375

2380

atc ccc tac agc aag acg att gta gaa cgc cat gtc gtc gag tcc ctt 7200

Ile Pro Tyr Ser Lys Thr Ile Val Glu Arg His Val Val Glu Ser Leu

2385

2390

2395

gac aat aac aac agg gag aat acg cat aga gca cca gac ggc gcg gct 7248

Asp Asn Asn Asn Arg Glu Asn Thr His Arg Ala Pro Asp Gly Ala Ala

2400

2405

2410

tgg atc tcg gcc gtc cgc tcc aag gcc gag cgc tgc acg tcc ctc tcc 7296

Trp Ile Ser Ala Val Arg Ser Lys Ala Glu Arg Cys Thr Ser Leu Ser

2415

2420

2425

gtg acc gat ctt gtg cag ctc ggg gaa gaa gcc ggc ttt cgc gta gaa 7344

Val Thr Asp Leu Val Gln Leu Gly Glu Glu Ala Gly Phe Arg Val Glu

2430

2435

2440

24/60

gtc agc gca gcg cgg cag tgg tct caa agc ggc gcg ctc gat gcc gtc 7392  
 Val Ser Ala Ala Arg Gln Trp Ser Gln Ser Gly Ala Leu Asp Ala Val  
 2445 2450 2455 2460

ttt cac cgc tat aat ttg ccc act caa agc aat agt cgc gtt ctg att 7440  
 Phe His Arg Tyr Asn Leu Pro Thr Gln Ser Asn Ser Arg Val Leu Ile  
 2465 2470 2475

cag ttc cct acc gaa gat ggc cag acg cga aga tcc gcc act ctg aca 7488  
 Gln Phe Pro Thr Glu Asp Gly Gln Thr Arg Arg Ser Ala Thr Leu Thr  
 2480 2485 2490

aac cga cca cta cag cgt ctg cag agc cgt cgg ttc gca tca cag atc 7536  
 Asn Arg Pro Leu Gln Arg Leu Gln Ser Arg Arg Phe Ala Ser Gln Ile  
 2495 2500 2505

cgc gaa cag ctg aag gcc gtg ctc ccg tca tac atg atc ccc tcc cgc 7584  
 Arg Glu Gln Leu Lys Ala Val Leu Pro Ser Tyr Met Ile Pro Ser Arg  
 2510 2515 2520

atc gtg gtc ata gac cag atg cct ctc aat gcc aat ggc aag gtc gac 7632  
 Ile Val Val Ile Asp Gln Met Pro Leu Asn Ala Asn Gly Lys Val Asp  
 2525 2530 2535 2540

cgg aaa gaa ctt acc aga agg gcc caa atc gcg ccg aaa tct cag gcg 7680  
 Arg Lys Glu Leu Thr Arg Arg Ala Gln Ile Ala Pro Lys Ser Gln Ala  
 2545 2550 2555

25/60

gct ccc gcc aaa ccc gtc aaa cag gtc gat ccg ttc gtc aac ctg gaa 7728

Ala Pro Ala Lys Pro Val Lys Gln Val Asp Pro Phe Val Asn Leu Glu

2560

2565

2570

gcc att tta tgt gag gag ttc gcg gag gtg ctg ggc atg gaa gtc ggc 7776

Ala Ile Leu Cys Glu Glu Phe Ala Glu Val Leu Gly Met Glu Val Gly

2575

2580

2585

gtg aac gac cac ttc ttc caa cta ggc gga cac tct ctc ttg gcc acg 7824

Val Asn Asp His Phe Phe Gln Leu Gly Gly His Ser Leu Leu Ala Thr

2590

2595

2600

aag ctc gtc gcg cgt ctc agt cgt cgg cta aac ggt cgt gtg tct gtg 7872

Lys Leu Val Ala Arg Leu Ser Arg Arg Leu Asn Gly Arg Val Ser Val

2605

2610

2615

2620

agg gat gtg ttc gac cag cct gtg att tcc gac ctc gca gtc acc ctc 7920

Arg Asp Val Phe Asp Gln Pro Val Ile Ser Asp Leu Ala Val Thr Leu

2625

2630

2635

cgc cag gga ctg acc ttg gaa aac gcc att ccc gca acg ccg gac agc 7968

Arg Gln Gly Leu Thr Leu Glu Asn Ala Ile Pro Ala Thr Pro Asp Ser

2640

2645

2650

ggg tat tgg gag cag aca atg tcc gca ccg aca acc ccg agc gac gac 8016

Gly Tyr Trp Glu Gln Thr Met Ser Ala Pro Thr Thr Pro Ser Asp Asp

2655

2660

2665

26/60

atg gag gcc gtg cta tgc aag gag ttt gcg gat gtg ctt ggc gtc gaa 8064

Met Glu Ala Val Leu Cys Lys Glu Phe Ala Asp Val Leu Gly Val Glu

2670

2675

2680

gtc agc gcc acc gac agc ttc ttc gat ctc ggt ggg cat tcc ctc atg 8112

Val Ser Ala Thr Asp Ser Phe Phe Asp Leu Gly Gly His Ser Leu Met

2685

2690

2695

2700

gct acg aag ctc gct gcg cgt att agc cgt cgg cta gat gta ccg gtg 8160

Ala Thr Lys Leu Ala Ala Arg Ile Ser Arg Arg Leu Asp Val Pro Val

2705

2710

2715

tca atc aaa gac ata ttc gat cac tca gtt cct cta aac ctt gcg agg 8208

Ser Ile Lys Asp Ile Phe Asp His Ser Val Pro Leu Asn Leu Ala Arg

2720

2725

2730

aag att cgg ctc act caa gca aaa ggc cac gaa gcg acc aat gga gta 8256

Lys Ile Arg Leu Thr Gln Ala Lys Gly His Glu Ala Thr Asn Gly Val

2735

2740

2745

caa atc gcc aac gac gcc cca ttc caa ctc att tcc gta gaa gat cca 8304

Gln Ile Ala Asn Asp Ala Pro Phe Gln Leu Ile Ser Val Glu Asp Pro

2750

2755

2760

gag ata ttc gtc caa cgt gaa atc gcc cct caa cta caa tgc tca ccc 8352

Glu Ile Phe Val Gln Arg Glu Ile Ala Pro Gln Leu Gln Cys Ser Pro

2765

2770

2775

2780

27/60

gag aca atc cta gac gtc tac ccc gcc acg caa atg caa agg gtc ttc 8400

Glu Thr Ile Leu Asp Val Tyr Pro Ala Thr Gln Met Gln Arg Val Phe

2785

2790

2795

ctc ctc aac cca gta aca gga aag ccg cgc tca cca acg cca ttt cac 8448

Leu Leu Asn Pro Val Thr Gly Lys Pro Arg Ser Pro Thr Pro Phe His

2800

2805

2810

ata gac ttc ccg ccg gac gca gac tgc gcc agc ctg atg cgg gca tgt 8496

Ile Asp Phe Pro Pro Asp Ala Asp Cys Ala Ser Leu Met Arg Ala Cys

2815

2820

2825

gca tct cta gcg aag cat ttc gat atc ttc agg acg gtg ttc ctc gaa 8544

Ala Ser Leu Ala Lys His Phe Asp Ile Phe Arg Thr Val Phe Leu Glu

2830

2835

2840

gcc aga ggc gaa ctc tac caa gta gtt cta aaa cac gtc gac gtg ccc 8592

Ala Arg Gly Glu Leu Tyr Gln Val Val Leu Lys His Val Asp Val Pro

2845

2850

2855

2860

atc gag atg ctc cag acc gaa gaa aac atc aac agc gcg acc cgg tcg 8640

Ile Glu Met Leu Gln Thr Glu Glu Asn Ile Asn Ser Ala Thr Arg Ser

2865

2870

2875

ttc ctg gac gta gac gca gaa aaa ccc atc cgg cta ggc cag cca ctg 8688

Phe Leu Asp Val Asp Ala Glu Lys Pro Ile Arg Leu Gly Gln Pro Leu

2880

2885

2890

28/60

atc cgc atc gcg ata cta gag aag ccc ggg tcc acg ctg cgc gtc atc 8736

Ile Arg Ile Ala Ile Leu Glu Lys Pro Gly Ser Thr Leu Arg Val Ile

2895

2900

2905

cta cga tta tcc cac gcc tta tac gac ggc ctg agc cta gag cac atc 8784

Leu Arg Leu Ser His Ala Leu Tyr Asp Gly Leu Ser Leu Glu His Ile

2910

2915

2920

ctg cac tct ctg cac atc ctc ttt ttc ggc ggc agt ctt ccc ccg ccg 8832

Leu His Ser Leu His Ile Leu Phe Phe Gly Gly Ser Leu Pro Pro Pro

2925

2930

2935

2940

ccc aag ttc gcc ggg tac atg caa cac gtc gcg agc agt cgc aga gaa 8880

Pro Lys Phe Ala Gly Tyr Met Gln His Val Ala Ser Ser Arg Arg Glu

2945

2950

2955

ggc tac gat ttc tgg cgt tcc gtt ctc cga gat tcg tct atg aca gtc 8928

Gly Tyr Asp Phe Trp Arg Ser Val Leu Arg Asp Ser Ser Met Thr Val

2960

2965

2970

atc aaa ggc aac aat aat aca act cca cca cct cct cct caa caa caa 8976

Ile Lys Gly Asn Asn Asn Thr Thr Pro Pro Pro Pro Pro Gln Gln Gln

2975

2980

2985

tcc acc ccc tcc gga gcc cac cac gcc tcc aaa gta gtc act atc cca 9024

Ser Thr Pro Ser Gly Ala His His Ala Ser Lys Val Val Thr Ile Pro

2990

2995

3000

29/60

acc caa gcc aac aca gac agc cgg atc acg cgc gcc acg atc ttc act 9072  
 Thr Gln Ala Asn Thr Asp Ser Arg Ile Thr Arg Ala Thr Ile Phe Thr  
 3005 3010 3015 3020

acc gct tgc gca cta atg ctc gcg aaa gaa gac aac tcc agc gac gtc 9120  
 Thr Ala Cys Ala Leu Met Leu Ala Lys Glu Asp Asn Ser Ser Asp Val  
 3025 3030 3035

gtc ttc ggg cgt acg gta tcg ggg cgt caa ggc ctg ccc cta gcc cac 9168  
 Val Phe Gly Arg Thr Val Ser Gly Arg Gln Gly Leu Pro Leu Ala His  
 3040 3045 3050

caa aac gtg atc gga cca tgt ctc aac caa gtg ccc gtg cgc gcg cgc 9216  
 Gln Asn Val Ile Gly Pro Cys Leu Asn Gln Val Pro Val Arg Ala Arg  
 3055 3060 3065

ggt tta aac cga gga acc act cac cac cga gaa ctt ctc cgc gag atg 9264  
 Gly Leu Asn Arg Gly Thr Thr His His Arg Glu Leu Leu Arg Glu Met  
 3070 3075 3080

caa gag caa tat ctc aac agt ctc gct ttc gaa act ctc ggg tac gac 9312  
 Gln Glu Gln Tyr Leu Asn Ser Leu Ala Phe Glu Thr Leu Gly Tyr Asp  
 3085 3090 3095 3100

gag atc aag gcg cac tgc aca gac tgg ccg gac gtg cca gcg acc gcg 9360  
 Glu Ile Lys Ala His Cys Thr Asp Trp Pro Asp Val Pro Ala Thr Ala  
 3105 3110 3115

30/60

agc ttc ggg tgc tgc atc gtg tac cag aac ttc gat tgc cac ccg gac 9408

Ser Phe Gly Cys Cys Ile Val Tyr Gln Asn Phe Asp Ser His Pro Asp

3120

3125

3130

agc cga gtc gaa gag cag cgg ctg cag atc ggg gtc ttg tgc cgg aac 9456

Ser Arg Val Glu Glu Gln Arg Leu Gln Ile Gly Val Leu Ser Arg Asn

3135

3140

3145

tac gag gct att aat gag ggg ctc gtg cat gat ctt gtt att gct ggg 9504

Tyr Glu Ala Ile Asn Glu Gly Leu Val His Asp Leu Val Ile Ala Gly

3150

3155

3160

gag tgc gag cct gat ggg gat gat ttg agg gtt act gtt gtg gcg aat 9552

Glu Ser Glu Pro Asp Gly Asp Asp Leu Arg Val Thr Val Val Ala Asn

3165

3170

3175

3180

cgg agg ttg tgc gat gag gaa agg ttg aag agg atg ctg gag gag ctg 9600

Arg Arg Leu Cys Asp Glu Glu Arg Leu Lys Arg Met Leu Glu Glu Leu

3185

3190

3195

tgt ggg aat att cgg gct ttg gcg ttg gtt tag 9633

Cys Gly Asn Ile Arg Ala Leu Ala Leu Val

3200

3205

&lt;210&gt; 2

&lt;211&gt; 3210

&lt;212&gt; PRT

&lt;213&gt; Mycelia sterilia

31/60

&lt;400&gt; 2

Met Ser Asn Met Ala Pro Leu Pro Thr Met Gly Val Glu Gln Gln Ala  
1 5 10 15

Leu Ser Leu Ser Cys Pro Leu Leu Pro His Asp Asp Glu Lys His Ser  
20 25 30

Asp Asn Leu Tyr Glu Gln Ala Thr Arg His Phe Gly Leu Ser Arg Asp  
35 40 45

Lys Ile Glu Asn Val Leu Pro Cys Thr Ser Phe Gln Cys Asp Val Ile  
50 55 60

Asp Cys Ala Val Asp Asp Arg Arg His Ala Ile Gly His Val Val Tyr  
65 70 75 80

Asp Ile Pro Asn Thr Val Asp Ile Gln Arg Leu Ala Ala Ala Trp Lys  
85 90 95

Glu Val Val Arg Gln Thr Pro Ile Leu Arg Thr Gly Ile Phe Thr Ser  
100 105 110

Glu Thr Gly Asp Ser Phe Gln Ile Val Leu Lys Glu Gly Cys Leu Pro  
115 120 125

Trp Met Tyr Ala Thr Cys Leu Gly Met Lys Gly Ala Val Ile Gln Asp  
130 135 140

32/60

Glu Ala Val Ala Ala Met Thr Gly Pro Arg Cys Asn Arg Tyr Val Val  
145 150 155 160

Leu Glu Asp Pro Ser Thr Lys Gln Arg Leu Leu Ile Trp Thr Phe Ser  
165 170 175

His Ala Leu Val Asp Tyr Thr Val Gln Glu Arg Ile Leu Gln Arg Val  
180 185 190

Leu Thr Val Tyr Asp Gly Arg Asp Val Glu Cys Pro Arg Ile Lys Asp  
195 200 205

Thr Glu His Val Ser Arg Phe Trp Gln Gln His Phe Glu Gly Leu Asp  
210 215 220

Ala Ser Val Phe Pro Leu Leu Pro Ser His Leu Thr Val Cys Asn Pro  
225 230 235 240

Asn Ala Arg Ala Glu His His Ile Ser Tyr Thr Gly Pro Val Gln Arg  
245 250 255

Lys Trp Ser His Thr Ser Ile Cys Arg Ala Ala Leu Ala Val Leu Leu  
260 265 270

Ser Arg Phe Thr His Ser Ser Glu Ala Leu Phe Gly Val Val Thr Glu  
275 280 285

Gln Ser His Asn Ser Glu Asp Gln Arg Arg Ser Ile Asp Gly Pro Ala  
290 295 300

33/60

Arg Thr Val Val Pro Ile Arg Val Leu Cys Ala Pro Asp Gln Tyr Val  
305 310 315 320

Ser Asp Val Ile Gly Ala Ile Thr Ala His Glu His Ala Met Arg Gly  
325 330 335

Phe Glu His Ala Gly Leu Arg Asn Ile Arg Arg Thr Gly Asp Asp Gly  
340 345 350

Ser Ala Ala Cys Gly Phe Gln Thr Val Leu Leu Val Thr Asp Gly Asp  
355 360 365

Ala Pro Lys Thr Pro Gly Ser Val Leu His Arg Ser Val Glu Glu Ser  
370 375 380

Asp Arg Phe Met Pro Cys Ala Asn Arg Ala Leu Leu Leu Asp Cys Gln  
385 390 395 400

Met Ala Gly Asn Ser Ala Ser Leu Val Ala Arg Tyr Asp His Asn Val  
405 410 415

Ile Asp Pro Arg Gln Met Ser Arg Phe Leu Arg Gln Leu Gly Tyr Leu  
420 425 430

Ile Gln Gln Phe His His His Val Asp Leu Pro Leu Val Lys Glu Leu  
435 440 445

34/60

Asp Val Val Thr Ala Glu Asp Cys Ala Glu Ile Glu Lys Trp Asn Ser  
450 455 460

Glu Arg Leu Thr Met Gln Asp Ala Leu Ile His Asp Thr Ile Ser Lys  
465 470 475 480

Trp Ala Ala Gly Asp Pro Asn Lys Ala Ala Val Phe Ala Trp Asp Gly  
485 490 495

Glu Trp Thr Tyr Ala Glu Leu Asp Asn Ile Ser Ser Arg Leu Ala Val  
500 505 510

Tyr Ile Gln Ser Leu Asp Leu Arg Pro Gly Gln Ala Ile Leu Pro Leu  
515 520 525

Cys Phe Glu Lys Ser Lys Trp Val Val Ala Thr Ile Leu Ala Val Leu  
530 535 540

Lys Val Gly Arg Ala Phe Thr Leu Ile Asp Pro Cys Asp Pro Ser Ala  
545 550 555 560

Arg Met Ala Gln Val Cys Gln Gln Thr Ser Ala Thr Val Ala Leu Thr  
565 570 575

Ser Lys Leu His Asn Thr Thr Leu Arg Ser Val Val Ser Arg Cys Ile  
580 585 590

Val Val Asp Asp Asp Leu Leu Arg Ser Leu Pro His Ala Asp Gly Arg  
595 600 605

35/60

Leu Lys Ala Thr Val Lys Pro Gln Asp Leu Ala Tyr Val Ile Phe Thr

610

615

620

Ser Gly Ser Thr Gly Glu Pro Lys Gly Ile Met Ile Glu His Arg Gly

625

630

635

640

Phe Val Ser Cys Ala Met Lys Phe Gly Pro Ala Leu Gly Met Asp Glu

645

650

655

His Thr Arg Ala Leu Gln Phe Ala Ser Tyr Ala Phe Gly Ala Cys Leu

660

665

670

Val Glu Val Val Thr Ala Leu Met His Gly Gly Cys Val Cys Ile Pro

675

680

685

Ser Asp Asp Asp Arg Leu Asn Asn Val Pro Glu Phe Ile Lys Arg Ala

690

695

700

Gln Val Asn Trp Val Ile Leu Thr Pro Ser Tyr Ile Gly Thr Phe Gln

705

710

715

720

Pro Glu Asp Val Pro Gly Leu Gln Thr Leu Val Leu Val Gly Glu Pro

725

730

735

Ile Ser Ala Ser Ile Arg Asp Thr Trp Ala Ser Gln Val Arg Leu Leu

740

745

750

36/60

Asn Ala Tyr Gly Gln Ser Glu Ser Ser Thr Met Cys Ser Val Thr Glu  
755 760 765

Val Ser Pro Leu Ser Leu Glu Pro Asn Asn Ile Gly Arg Ala Val Gly  
770 775 780

Ala Arg Ser Trp Ile Ile Asp Pro Asp Glu Pro Asp Arg Leu Ala Pro  
785 790 795 800

Ile Gly Cys Ile Gly Glu Leu Val Ile Glu Ser Pro Gly Ile Ala Arg  
805 810 815

Asp Tyr Ile Ile Ala Pro Pro Pro Asp Lys Ser Pro Phe Leu Leu Ala  
820 825 830

Pro Pro Ala Trp Tyr Pro Ala Gly Lys Leu Ser Asn Ala Phe Lys Phe  
835 840 845

Tyr Lys Thr Gly Asp Leu Val Arg Tyr Gly Pro Asp Gly Thr Ile Val  
850 855 860

Cys Leu Gly Arg Lys Asp Ser Gln Val Lys Ile Arg Gly Gln Arg Val  
865 870 875 880

Glu Ile Ser Ala Val Glu Ala Ser Leu Arg Arg Gln Leu Pro Ser Asp  
885 890 895

Ile Met Pro Val Ala Glu Ala Ile Lys Arg Ser Asp Ser Ser Gly Ser  
900 905 910

37/60

Thr Val Leu Thr Ala Phe Leu Ile Gly Ser Ser Lys Ser Gly Asp Gly  
915 920 925

Asn Gly His Ala Leu Ser Ala Ala Asp Ala Val Ile Leu Asp His Gly  
930 935 940

Ala Thr Asn Glu Ile Asn Ala Lys Leu Gln Gln Ile Leu Pro Gln His  
945 950 955 960

Ser Val Pro Ser Tyr Tyr Ile His Met Glu Asn Leu Pro Arg Thr Ala  
965 970 975

Thr Gly Lys Ala Asp Arg Lys Met Leu Arg Ser Ile Ala Ser Lys Leu  
980 985 990

Leu Gly Glu Leu Ser Gln Asn Val Thr Ser Gln Pro Ile Glu Lys His  
995 1000 1005

Asp Ala Pro Ala Thr Gly Ile Glu Val Lys Leu Lys Glu Leu Trp Phe  
1010 1015 1020

Leu Ser Leu Asn Leu Asn Pro Asn Ser Gln Asp Val Gly Ala Ser Phe  
1025 1030 1035 1040

Phe Asp Leu Gly Gly Asn Ser Ile Ile Ala Ile Lys Met Val Asn Met  
1045 1050 1055

Ala Arg Ser Ala Gly Ile Ala Leu Lys Val Ser Asp Ile Phe Gln Asn  
1060 1065 1070

38/60

Pro Thr Leu Ala Gly Leu Val Asp Val Ile Gly Arg Asp Pro Ala Pro  
1075 1080 1085

Tyr Asn Leu Ile Pro Thr Thr Ala Tyr Ser Gly Pro Val Glu Gln Ser  
1090 1095 1100

Phe Ala Gln Gly Arg Leu Trp Phe Leu Asp Gln Ile Glu Leu Asp Ala  
105 1110 1115 1120

Leu Trp Tyr Leu Leu Pro Tyr Ala Val Arg Met Arg Gly Pro Leu His  
1125 1130 1135

Ile Asp Ala Leu Thr Ile Ala Leu Leu Ala Ile Gln Gln Arg His Glu  
1140 1145 1150

Thr Leu Arg Thr Thr Phe Glu Glu Gln Asp Gly Val Gly Val Gln Val  
1155 1160 1165

Val His Ala Ser Pro Ile Ser Asp Leu Arg Ile Ile Asp Val Ser Gly  
1170 1175 1180

Asp Arg Asn Ser Asp Tyr Leu Gln Leu Leu His Gln Glu Gln Thr Thr  
185 1190 1195 1200

Pro Phe Ile Leu Ala Cys Gln Ala Gly Trp Arg Val Ser Leu Ile Arg  
1205 1210 1215

39/60

Leu Gly Glu Asp Asp His Ile Leu Ser Ile Val Met His His Ile Ile

1220

1225

1230

Ser Asp Gly Trp Ser Ile Asp Ile Leu Arg Arg Glu Leu Ser Asn Phe

1235

1240

1245

Tyr Ser Ala Ala Leu Arg Gly Ser Asp Pro Leu Ser Val Val Ser Pro

1250

1255

1260

Leu Pro Leu His Tyr Arg Asp Phe Ser Val Trp Gln Lys Gln Val Glu

265

1270

1275

1280

Gln Glu Thr Glu His Glu Arg Gln Leu Glu Tyr Trp Val Lys Gln Leu

1285

1290

1295

Ala Asp Ser Ser Ala Ala Glu Phe Leu Thr Asp Phe Pro Arg Pro Asn

1300

1305

1310

Ile Leu Ser Gly Glu Ala Gly Ser Val Pro Val Thr Ile Glu Gly Glu

1315

1320

1325

Leu Tyr Glu Arg Leu Gln Glu Phe Cys Lys Val Glu Gln Met Thr Pro

1330

1335

1340

Phe Ala Val Leu Leu Gly Ala Phe Arg Ala Thr His Tyr Arg Leu Thr

345

1350

1355

1360

Gly Ala Glu Asp Ser Ile Ile Gly Thr Pro Ile Ala Asn Arg Asn Arg

1365

1370

1375

40/60

Gln Glu Leu Glu Asn Met Ile Gly Phe Phe Val Asn Thr Gln Cys Met

1380

1385

1390

Arg Ile Thr Val Asp Gly Asp Asp Thr Phe Glu Ser Leu Val Arg Gln

1395

1400

1405

Val Arg Thr Thr Ala Thr Ala Ala Phe Glu His Gln Asp Val Pro Phe

1410

1415

1420

Glu Arg Val Val Thr Ala Leu Leu Pro Arg Ser Arg Asp Leu Ser Arg

425

1430

1435

1440

Asn Pro Leu Ala Gln Leu Thr Phe Ala Leu His Ser Gln Gln Asp Leu

1445

1450

1455

Gly Lys Phe Glu Leu Glu Gly Leu Val Ala Glu Pro Val Ser Asn Lys

1460

1465

1470

Val Tyr Thr Arg Phe Asp Val Glu Phe His Leu Phe Gln Glu Ala Gly

1475

1480

1485

Arg Leu Ser Gly Asn Val Ala Phe Ala Ala Asp Leu Phe Lys Pro Glu

1490

1495

1500

Thr Ile Ser Asn Val Val Ala Ile Phe Phe Gln Ile Leu Arg Gln Gly

505

1510

1515

1520

41/60

Ile Arg Gln Pro Arg Thr Pro Ile Ala Val Leu Pro Leu Thr Asp Gly

1525

1530

1535

Leu Ala Asp Leu Arg Ala Met Gly Leu Leu Glu Ile Glu Lys Ala Glu

1540

1545

1550

Tyr Pro Arg Glu Ser Ser Val Val Asp Val Phe Arg Lys Gln Val Ala

1555

1560

1565

Ala His Pro His Ala Phe Ala Val Val Asp Ser Ala Ser Arg Leu Thr

1570

1575

1580

Tyr Ala Asp Leu Asp Arg Gln Ser Asp Gln Leu Ala Thr Trp Leu Gly

585

1590

1595

1600

Arg Arg Asn Met Thr Ala Glu Thr Leu Val Gly Val Leu Ala Pro Arg

1605

1610

1615

Ser Cys Gln Thr Val Val Ala Ile Leu Gly Ile Leu Lys Ala Asn Leu

1620

1625

1630

Ala Tyr Leu Pro Leu Asp Val Asn Cys Pro Thr Ala Arg Leu Gln Thr

1635

1640

1645

Ile Leu Ser Thr Leu Asn Arg His Lys Leu Val Leu Leu Gly Ser Asn

1650

1655

1660

Ala Thr Thr Pro Asp Val Gln Ile Pro Asp Val Glu Leu Val Arg Ile

665

1670

1675

1680

42/60

Ser Asp Ile Leu Asp Arg Pro Ile Asn Gly Gln Ala Lys Leu Asn Gly

1685

1690

1695

His Thr Lys Ser Asn Gly Tyr Ser Lys Pro Asn Gly Tyr Thr His Leu

1700

1705

1710

Lys Gly Tyr Ser Asn Leu Asn Gly Tyr Ser Lys Gln Asn Gly Tyr Ala

1715

1720

1725

Gln Leu Asn Gly His Arg Glu Arg Asn Asn Tyr Leu Asp Leu Asn Gly

1730

1735

1740

His Ser Leu Leu Asn Gly Asn Ser Asp Ile Thr Thr Ser Gly Pro Ser

745

1750

1755

1760

Ala Thr Ser Leu Ala Tyr Val Ile Phe Thr Ser Gly Ser Thr Gly Lys

1765

1770

1775

Pro Lys Gly Val Met Val Glu His Arg Ser Ile Ile Arg Leu Ala Lys

1780

1785

1790

Lys Asn Arg Ile Ile Ser Arg Phe Pro Ser Val Ala Lys Val Ala His

1795

1800

1805

Leu Ser Asn Ile Ala Phe Asp Ala Ala Thr Trp Glu Met Phe Ala Ala

1810

1815

1820

43/60

Leu Leu Asn Gly Gly Thr Leu Val Cys Ile Asp Tyr Met Thr Thr Leu  
825 1830 1835 1840

Asp Ser Lys Thr Leu Glu Ala Ala Phe Ala Arg Glu Gln Ile Asn Ala  
1845 1850 1855

Ala Leu Leu Thr Pro Ala Leu Leu Lys Gln Cys Leu Ala Asn Ile Pro  
1860 1865 1870

Thr Thr Leu Gly Arg Leu Ser Ala Leu Val Ile Gly Gly Asp Arg Leu  
1875 1880 1885

Asp Gly Gln Asp Ala Ile Ala Ala His Ala Leu Val Gly Ala Gly Val  
1890 1895 1900

Tyr Asn Ala Tyr Gly Pro Thr Glu Asn Gly Val Ile Ser Thr Ile Tyr  
905 1910 1915 1920

Asn Ile Thr Lys Asn Asp Ser Phe Ile Asn Gly Val Pro Ile Gly Cys  
1925 1930 1935

Ala Ile Ser Asn Ser Gly Ala Tyr Ile Thr Asp Pro Asp Gln Gln Leu  
1940 1945 1950

Val Pro Pro Gly Val Met Gly Glu Leu Val Val Thr Gly Asp Gly Leu  
1955 1960 1965

Ala Arg Gly Tyr Thr Asp Pro Ala Leu Asp Ala Gly Arg Phe Val Gln  
1970 1975 1980

44/60

Ile Met Ile Asn Asp Lys Ala Val Arg Ala Tyr Arg Thr Gly Asp Arg  
985 1990 1995 2000

Ala Arg Tyr Arg Val Gly Asp Gly Gln Ile Glu Phe Phe Gly Arg Met  
2005 2010 2015

Asp Gln Gln Val Lys Ile Arg Gly His Arg Ile Glu Pro Ala Glu Val  
2020 2025 2030

Glu Arg Ala Ile Leu Asp Gln Asp Ser Ala Arg Asp Ala Val Val Val  
2035 2040 2045

Ile Arg His Gln Glu Gly Glu Glu Pro Glu Met Val Gly Phe Val Ala  
2050 2055 2060

Thr His Gly Asp His Ser Ala Glu Gln Glu Glu Ala Asp Asp Gln Val  
065 2070 2075 2080

Glu Gly Trp Lys Asp Phe Phe Glu Ser Asn Thr Tyr Ala Asp Met Asp  
2085 2090 2095

Thr Ile Gly Gln Ser Ala Ile Gly Asn Asp Phe Thr Gly Trp Thr Ser  
2100 2105 2110

Met Tyr Asp Gly Ser Glu Ile Asn Lys Ala Glu Met Gln Glu Trp Leu  
2115 2120 2125

45/60

Asp Asp Thr Met Arg Thr Leu Leu Asp Gly Gln Ala Pro Gly His Val

2130

2135

2140

Leu Glu Ile Gly Thr Gly Ser Gly Met Val Leu Phe Asn Leu Gly Ala

145

2150

2155

2160

Gly Leu Gln Ser Tyr Val Gly Leu Glu Pro Ser Arg Ser Ala Ala Thr

2165

2170

2175

Phe Val Thr Lys Ala Ile Asn Ser Thr Pro Ala Leu Ala Gly Lys Ala

2180

2185

2190

Glu Val His Val Gly Thr Ala Thr Asp Ile Asn Arg Leu Arg Gly Leu

2195

2200

2205

Arg Pro Asp Leu Val Val Leu Asn Ser Val Val Gln Tyr Phe Pro Thr

2210

2215

2220

Pro Glu Tyr Leu Leu Glu Val Val Glu Ser Leu Val Arg Ile Pro Gly

225

2230

2235

2240

Val Lys Arg Val Val Phe Gly Asp Ile Arg Ser His Ala Thr Asn Arg

2245

2250

2255

His Phe Leu Ala Ala Arg Ala Leu His Ser Leu Gly Ser Lys Ala Thr

2260

2265

2270

Lys Asp Ala Ile Arg Gln Lys Met Thr Glu Met Glu Glu Arg Glu Glu

2275

2280

2285

46/60

Glu Leu Leu Val Asp Pro Ala Phe Phe Thr Ala Leu Leu Gln Gly Gln

2290

2295

2300

Leu Ala Asp Arg Ile Lys His Val Glu Ile Leu Pro Lys Asn Met Arg

305

2310

2315

2320

Ala Thr Asn Glu Leu Ser Ala Tyr Arg Tyr Thr Ala Val Ile His Val

2325

2330

2335

Arg Gly Pro Glu Glu Gln Ser Arg Pro Val Tyr Pro Ile Gln Val Asn

2340

2345

2350

Asp Trp Ile Asp Phe Gln Ala Ser Arg Ile Asp Arg Arg Ala Leu Leu

2355

2360

2365

Arg Leu Leu Gln Arg Ser Ala Asp Ala Ala Thr Val Ala Val Ser Asn

2370

2375

2380

Ile Pro Tyr Ser Lys Thr Ile Val Glu Arg His Val Val Glu Ser Leu

385

2390

2395

2400

Asp Asn Asn Asn Arg Glu Asn Thr His Arg Ala Pro Asp Gly Ala Ala

2405

2410

2415

Trp Ile Ser Ala Val Arg Ser Lys Ala Glu Arg Cys Thr Ser Leu Ser

2420

2425

2430

47/60

Val Thr Asp Leu Val Gln Leu Gly Glu Glu Ala Gly Phe Arg Val Glu

2435

2440

2445

Val Ser Ala Ala Arg Gln Trp Ser Gln Ser Gly Ala Leu Asp Ala Val

2450

2455

2460

Phe His Arg Tyr Asn Leu Pro Thr Gln Ser Asn Ser Arg Val Leu Ile

465

2470

2475

2480

Gln Phe Pro Thr Glu Asp Gly Gln Thr Arg Arg Ser Ala Thr Leu Thr

2485

2490

2495

Asn Arg Pro Leu Gln Arg Leu Gln Ser Arg Arg Phe Ala Ser Gln Ile

2500

2505

2510

Arg Glu Gln Leu Lys Ala Val Leu Pro Ser Tyr Met Ile Pro Ser Arg

2515

2520

2525

Ile Val Val Ile Asp Gln Met Pro Leu Asn Ala Asn Gly Lys Val Asp

2530

2535

2540

Arg Lys Glu Leu Thr Arg Arg Ala Gln Ile Ala Pro Lys Ser Gln Ala

545

2550

2555

2560

Ala Pro Ala Lys Pro Val Lys Gln Val Asp Pro Phe Val Asn Leu Glu

2565

2570

2575

Ala Ile Leu Cys Glu Glu Phe Ala Glu Val Leu Gly Met Glu Val Gly

2580

2585

2590

48/60

Val Asn Asp His Phe Phe Gln Leu Gly Gly His Ser Leu Leu Ala Thr

2595

2600

2605

Lys Leu Val Ala Arg Leu Ser Arg Arg Leu Asn Gly Arg Val Ser Val

2610

2615

2620

Arg Asp Val Phe Asp Gln Pro Val Ile Ser Asp Leu Ala Val Thr Leu

625

2630

2635

2640

Arg Gln Gly Leu Thr Leu Glu Asn Ala Ile Pro Ala Thr Pro Asp Ser

2645

2650

2655

Gly Tyr Trp Glu Gln Thr Met Ser Ala Pro Thr Thr Pro Ser Asp Asp

2660

2665

2670

Met Glu Ala Val Leu Cys Lys Glu Phe Ala Asp Val Leu Gly Val Glu

2675

2680

2685

Val Ser Ala Thr Asp Ser Phe Phe Asp Leu Gly Gly His Ser Leu Met

2690

2695

2700

Ala Thr Lys Leu Ala Ala Arg Ile Ser Arg Arg Leu Asp Val Pro Val

705

2710

2715

2720

Ser Ile Lys Asp Ile Phe Asp His Ser Val Pro Leu Asn Leu Ala Arg

2725

2730

2735

49/60

Lys Ile Arg Leu Thr Gln Ala Lys Gly His Glu Ala Thr Asn Gly Val

2740

2745

2750

Gln Ile Ala Asn Asp Ala Pro Phe Gln Leu Ile Ser Val Glu Asp Pro

2755

2760

2765

Glu Ile Phe Val Gln Arg Glu Ile Ala Pro Gln Leu Gln Cys Ser Pro

2770

2775

2780

Glu Thr Ile Leu Asp Val Tyr Pro Ala Thr Gln Met Gln Arg Val Phe

785

2790

2795

2800

Leu Leu Asn Pro Val Thr Gly Lys Pro Arg Ser Pro Thr Pro Phe His

2805

2810

2815

Ile Asp Phe Pro Pro Asp Ala Asp Cys Ala Ser Leu Met Arg Ala Cys

2820

2825

2830

Ala Ser Leu Ala Lys His Phe Asp Ile Phe Arg Thr Val Phe Leu Glu

2835

2840

2845

Ala Arg Gly Glu Leu Tyr Gln Val Val Leu Lys His Val Asp Val Pro

2850

2855

2860

Ile Glu Met Leu Gln Thr Glu Glu Asn Ile Asn Ser Ala Thr Arg Ser

865

2870

2875

2880

Phe Leu Asp Val Asp Ala Glu Lys Pro Ile Arg Leu Gly Gln Pro Leu

2885

2890

2895

50/60

Ile Arg Ile Ala Ile Leu Glu Lys Pro Gly Ser Thr Leu Arg Val Ile

2900

2905

2910

Leu Arg Leu Ser His Ala Leu Tyr Asp Gly Leu Ser Leu Glu His Ile

2915

2920

2925

Leu His Ser Leu His Ile Leu Phe Phe Gly Gly Ser Leu Pro Pro Pro

2930

2935

2940

Pro Lys Phe Ala Gly Tyr Met Gln His Val Ala Ser Ser Arg Arg Glu

945

2950

2955

2960

Gly Tyr Asp Phe Trp Arg Ser Val Leu Arg Asp Ser Ser Met Thr Val

2965

2970

2975

Ile Lys Gly Asn Asn Asn Thr Thr Pro Pro Pro Pro Pro Gln Gln Gln

2980

2985

2990

Ser Thr Pro Ser Gly Ala His His Ala Ser Lys Val Val Thr Ile Pro

2995

3000

3005

Thr Gln Ala Asn Thr Asp Ser Arg Ile Thr Arg Ala Thr Ile Phe Thr

3010

3015

3020

Thr Ala Cys Ala Leu Met Leu Ala Lys Glu Asp Asn Ser Ser Asp Val

025

3030

3035

3040

51/60

Val Phe Gly Arg Thr Val Ser Gly Arg Gln Gly Leu Pro Leu Ala His

3045

3050

3055

Gln Asn Val Ile Gly Pro Cys Leu Asn Gln Val Pro Val Arg Ala Arg

3060

3065

3070

Gly Leu Asn Arg Gly Thr Thr His His Arg Glu Leu Leu Arg Glu Met

3075

3080

3085

Gln Glu Gln Tyr Leu Asn Ser Leu Ala Phe Glu Thr Leu Gly Tyr Asp

3090

3095

3100

Glu Ile Lys Ala His Cys Thr Asp Trp Pro Asp Val Pro Ala Thr Ala

105

3110

3115

3120

Ser Phe Gly Cys Cys Ile Val Tyr Gln Asn Phe Asp Ser His Pro Asp

3125

3130

3135

Ser Arg Val Glu Glu Gln Arg Leu Gln Ile Gly Val Leu Ser Arg Asn

3140

3145

3150

Tyr Glu Ala Ile Asn Glu Gly Leu Val His Asp Leu Val Ile Ala Gly

3155

3160

3165

Glu Ser Glu Pro Asp Gly Asp Asp Leu Arg Val Thr Val Val Ala Asn

3170

3175

3180

Arg Arg Leu Cys Asp Glu Glu Arg Leu Lys Arg Met Leu Glu Glu Leu

185

3190

3195

3200

52/60

Cys Gly Asn Ile Arg Ala Leu Ala Leu Val

3205

3210

&lt;210&gt; 3

&lt;211&gt; 7

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence:consensus sequence

&lt;400&gt; 3

Trp Thr Ser Met Tyr Asp Gly

1

5

&lt;210&gt; 4

&lt;211&gt; 7

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence:consensus sequence

&lt;400&gt; 4

Val Val Gln Tyr Phe Pro Thr

1

5

53/60

&lt;210&gt; 5

&lt;211&gt; 20

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:primer for cyclic depsipeptide  
synthetase gene

&lt;400&gt; 5

tggacnwsna tgtaygaygg

20

&lt;210&gt; 6

&lt;211&gt; 20

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:primer for cyclic depsipeptide  
synthetase gene

&lt;400&gt; 6

gtnggraart aytgnacnac

20

&lt;210&gt; 7

&lt;211&gt; 30

54/60

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:primer for cyclic depsipeptide synthetase gene

&lt;400&gt; 7

gcggaattaa ccctcactaa agggaacgaa

30

&lt;210&gt; 8

&lt;211&gt; 30

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:primer for cyclic depsipeptide synthetase gene

&lt;400&gt; 8

gcgtaatacg actcactata gggcgaagaa

30

&lt;210&gt; 9

&lt;211&gt; 41

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

55/60

&lt;220&gt;

<223> Description of Artificial Sequence:primer for cyclic depsipeptide synthetase gene

&lt;400&gt; 9

agcatcggat cctaacaatg ggcgttgagc agcaagccct a

41

&lt;210&gt; 10

&lt;211&gt; 21

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:primer for cyclic depsipeptide synthetase gene

&lt;400&gt; 10

tttgettctg actcgggtcc t

21

&lt;210&gt; 11

&lt;211&gt; 42

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:primer for cyclic depsipeptide synthetase gene

56/60

&lt;400&gt; 11

agcatcggat cctaacaatg tcaaacaatgg caccactccc ta

42

&lt;210&gt; 12

&lt;211&gt; 20

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:primer for cyclic depsipeptide  
synthetase gene

&lt;400&gt; 12

gcatcgcgat actagagaag

20

&lt;210&gt; 13

&lt;211&gt; 42

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:primer for cyclic depsipeptide  
synthetase gene

&lt;400&gt; 13

agcatcgaat tcggatccct aaaccaacgc caaagcccgga at

42

57/60

&lt;210&gt; 14

&lt;211&gt; 20

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence:primer for Abp1 gene

&lt;400&gt; 14

ctcaaaccag gaactctttc

20

&lt;210&gt; 15

&lt;211&gt; 22

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence:primer for Abp1 gene

&lt;400&gt; 15

gacatgtgga aaccacattt tg

22

&lt;210&gt; 16

&lt;211&gt; 29

&lt;212&gt; DNA

58/60

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for Abp1 gene

<400> 16

ggggaattcg tgggtggtga tatcatggc

29

<210> 17

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for Abp1 gene

<400> 17

gggggatcct tgatgggttt tggg

24

<210> 18

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for Abp1 gene

59/60

&lt;400&gt; 18

gggggacccct aaactcccat ctatagc

27

&lt;210&gt; 19

&lt;211&gt; 29

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence:primer for Abp1 gene

&lt;400&gt; 19

gggtctagac gactcattgc agtgagtgg

29

&lt;210&gt; 20

&lt;211&gt; 20

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence:primer for Abp 1 gene promoter

&lt;400&gt; 20

tgatatgctg gagcttcct

20

60/60

&lt;210&gt; 21

&lt;211&gt; 20

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:primer for cyclic depsipeptide  
synthetase gene

&lt;400&gt; 21

gcacaacctc tttccaggct

20